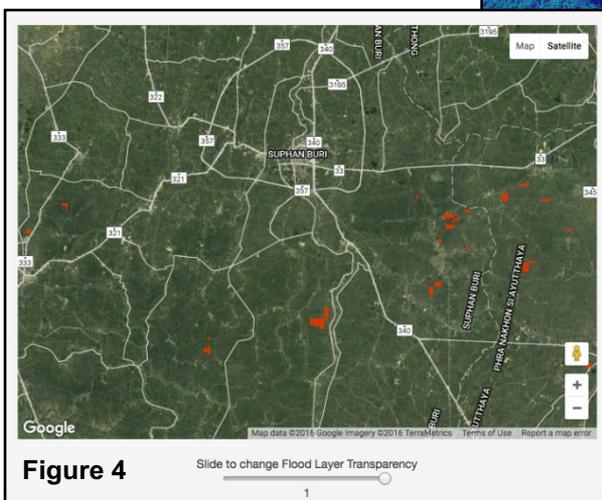
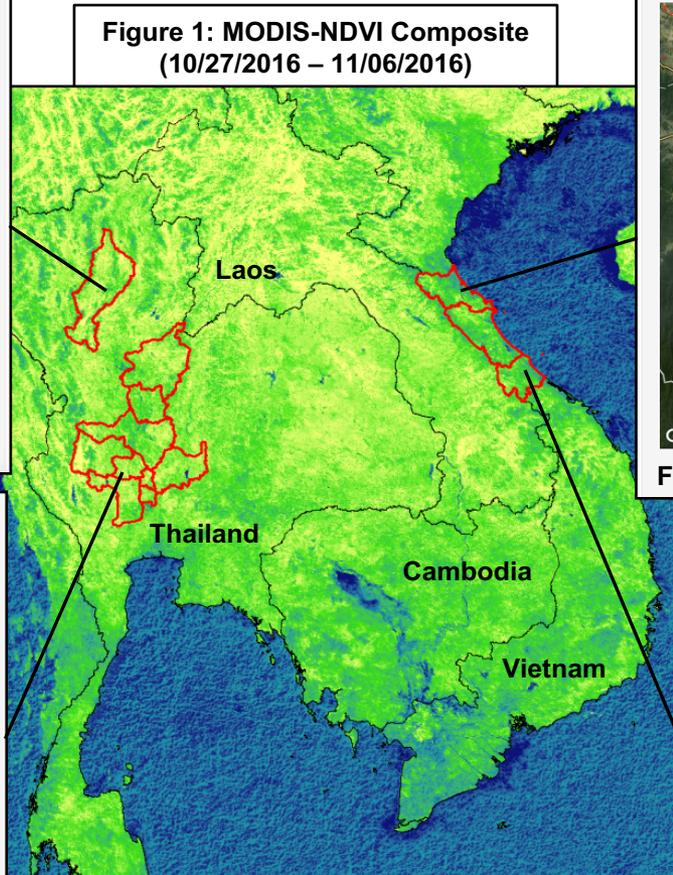
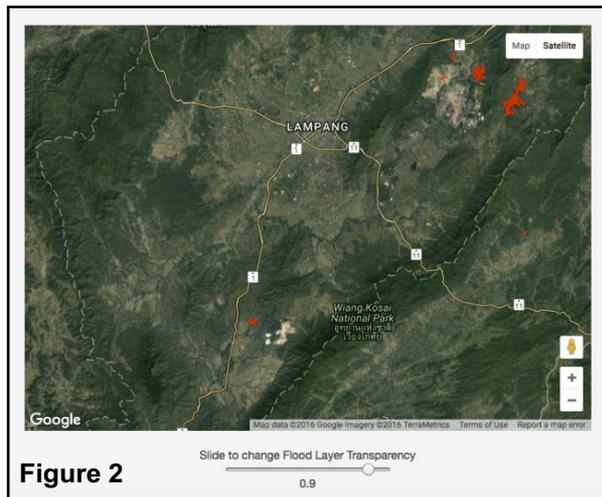




# Detecting Recent Southeast Asia Flooding in Near Real Time from MODIS

Aakash Ahamed, Hydrological Sciences, NASA GSFC and USRA,  
John D. Bolten, Hydrological Sciences, NASA GSFC,



Near Real Time MODIS observations improve impact assessments for flood events reported by international agencies in the flood-prone Lower Mekong region of Southeast Asia.



Name: John Bolten, Hydrological Sciences, NASA GSFC

E-mail: john.bolten@nasa.gov

Phone: 301-614-6529

### References:

Ahamed, A., Bolten, J.D. (In Prep). Remote Sensing Information Systems for Real-Time and Historic Flood Monitoring in Southeast Asia.

Ahamed, A., Bolten, J.D., Doyle, C.S., Fayne, J., (2017). Near Real Time Flood Monitoring and Impact Assessment Systems. In *Remote Sensing of Hydrological Extremes*.

Project website: <http://projectmekongnasa.appspot.com>

### Data Sources:

Earth observation datasets – MODIS Surface Reflectance MOD/MYD09GA and MOD/MYD35 for Near Real-Time product; MODIS Permanent Water Bodies (MOD44W) with MOD/MYD09 Q1 and A1 surface reflectance to train surface water classifiers.

### Technical Description of Figures:

**Figure 1 (center):** False Color NDVI composite computed from MODIS surface reflectance observations made in Southeast Asia between 10/02/2016 – 11/06/2016. Red polygons indicate provinces in Thailand (left) and Vietnam (right) experiencing flooding, reported by the International Federation of Red Cross and Red Crescent Societies (<http://www.ifrc.org/>). Flooding in Vietnam was reported on 10/30/16 – 11/01/16; flooding in Thailand was reported on 10/05/2016.

**Figures 2 - 5 (outer):** High resolution 250m surface water extent derived from near real-time LANCE – MODIS imagery for the days on which flooding was reported. Surface water is classified using the historic NDVI signatures (MOD09Q1) of permanent water bodies (MOD 44W). Each image is a screenshot of the operational flood monitoring system taken on the day of the reported flood. The images show (clockwise from top-left) Lampang, Thailand on 10/5; Ha Tinh, Vietnam on 11/1; Quan Tri, Vietnam on 11/1; and Chainat, Thailand on 10/5.

### Scientific significance, societal relevance, and relationships to future missions:

Flood disaster events in Southeast Asia result in significant loss of life and economic damage. International agencies and governments typically report flood disasters at the province or district level, often after the onset of an event. These reports traditionally rely on correspondence with local municipalities, census data, information from news and media agencies, and back of the envelope calculations. Remote sensing information systems designed to monitor floods in near real-time can significantly improve the spatial resolution and accuracy of information procured by international agencies like the Red Cross, and serve as decision support tools to formulate effective response to sudden onset events. An operational near real-time monitoring system (available at <http://projectmekongnasa.appspot.com>) and supporting software tools automatically assess flood impacts to population and infrastructure to provide a rapid first set of impact numbers generated hours after the onset of an event. MODIS-derived surface water extent products (e.g. Figures 2-6) exhibit good agreement (80-90%) when compared to high resolution (22m – 150m) radar data (TerraSAR-X, Envisat ASAR, Disaster Monitoring Constellation), during both flood and non-flood conditions. These methods can help guide radar satellite tasking in persistently cloudy or highly damaged areas, and may be extended to other sensors (e.g. VIIRS, Landsat), as well as future missions.